Obligate corallivorous filefish (*Oxymonacanthus longirostris*) switches diet from *Acropora* to *Pocillopora* corals following habitat loss

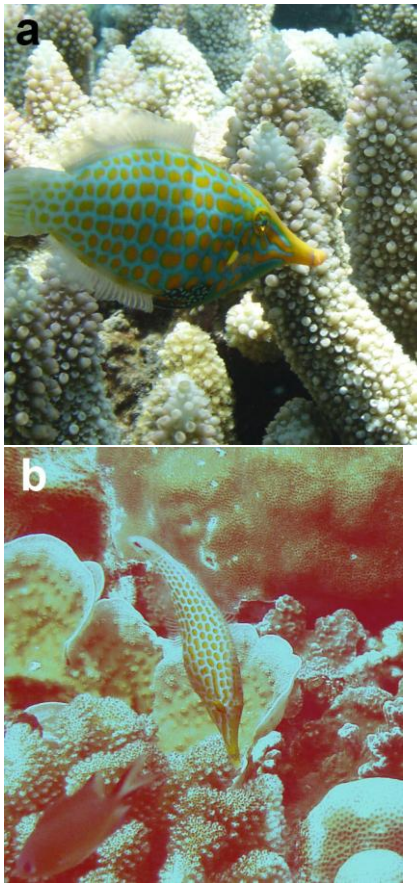

Fig. 1 a *Oxymonacanthus longirostris* and its typical food source (*Acropora* corals), and **b** feeding on *Pocillopora verrucosa* at Christmas Island.

The high diversity of coral reef fishes is threatened by increasing habitat destruction. The greatest impact has been on habitat and dietary specialists, particularly those dependent on *Acropora* corals (Pratchett et al. 2008). The future of these specialist species will depend on their ability to use alternate resources.

One of the most specialized species is the harlequin filefish (*Oxymonacanthus longirostris*), which feeds almost exclusively on live *Acropora* corals (Kokita and Nakazono 2001; Brooker et al. 2012). *Acropora* corals are particularly susceptible to disturbances, and recent mortality on many reefs has resulted in local extinctions of the harlequin filefish (Kokita and Nakazono 2001).

Extensive surveys from 2002 to 2008 confirmed the extinction of the harlequin filefish at Christmas Island (Indian Ocean) following the loss of *Acropora* corals (Hobbs et al. 2010). However, one individual was recently seen at a monitoring site in Flyingfish Cove on December 14, 2011. Most strikingly, this individual was feeding almost entirely on *Pocillopora verrucosa* (Fig. 1, Online Resource 1). During 30 minutes of observations the individual took 372 bites from nine different colonies and 12 bites from areas of dead coral. The following day it took 109 bites from four *P. verrucosa* colonies and seven bites of dead coral during 10 minutes.

Before extinction at Christmas Island, harlequin filefish were only seen in stands of branching *Acropora*. At Flyingfish Cove, *Acropora* cover has decreased from 18% in 2005 to 7% in 2011 (2011 dominated by *A. hyacinthus, A. clathrata, A. cytherea, A. monticulosa*). In 2011, the mean density of *Pocillopora* colonies at this site was much greater than *Acropora* colonies (41 versus 16 colonies per 120 m^2). Given that disturbances are causing corals reefs to transition from *Acropora* to *Pocillopora/Porites* dominated communities (Pratchett et al. 2008), dietary changes will become increasingly important for the persistence of this filefish. However, this filefish is known to reduce in size and reproductive development when feeding on non-preferred corals (Kokita and Nakazono 2001; Brooker et al. 2012). Therefore, switching diet to non-preferred corals could represent a change in behavior that delays inevitable death. Although the harlequin filefish has the capacity to switch its diet to non-*Acropora* corals, its future will also depend on its ability to grow and reproduce while using alternate food sources.

References:

Brooker RM, Jones GP, Munday PL (2012) Prey selectivity affects reproductive success of a corallivorous reef fish. Oecologia DOI 10.1007/s00442-012-2521-7

Hobbs J-PA, Ayling AM, Choat JH, Gilligan JJ, McDonald CA, Neilson J, Newman SJ (2010) New records of marine fishes illustrate the biogeographic importance of Christmas Island, Indian Ocean. Zootaxa 2422:63-68

Kokita T, Nakazono A (2001) Rapid response of an obligately corallivorous filefish *Oxymonacanthus longirostris* (Monacanthidae) to a mass coral bleaching event. Coral Reefs 20:155–158

Pratchett MS, Munday PL, Wilson SK, Graham NAJ, Cinner JE, Bellwood DR, Jones GP, Polunin NVC, McClanahan TR (2008) Effects of climate-induced coral bleaching on coral-reef fishes: ecological and economic consequences. Oceanogr Mar Biol Annu Rev 46:251–296

Jean-Paul A. Hobbs
The Oceans Institute and School of Plant Biology, The University of Western Australia, 35 Stirling Highway, Crawley, WA, Australia 6009
e-mail: jean-paul.hobbs@uwa.edu.au